

SEMESTER END EXAMINATION, MAY, 2024

Course Name: - B.Tech CSE
Paper Name: - Operating System

Semester:- IV
Paper Code: - TCS 401

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer.
समय- 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त-दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए।

Max Marks-70
अधिकतम अंक-70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 3 mark. All questions are compulsory.
- Section B- Answer any 5 out of 7 given questions in maximum one hundred fifty (150) words. Each question carries 7 marks.
- Section C- Answer any 2 out of 3 given questions in maximum three hundred (300) words. Each question carries 10 marks.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड-अ में प्रत्येक प्रश्न तीन अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड-ब में सात प्रश्नों में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न सात अंक का है।
- खण्ड-स में तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न 10 अंक का है।

Section - A (खण्ड-अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions.

5x3 =15

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

- Which of the following mechanisms is a locking mechanism?
 - Semaphore
 - PCB
 - Mutex
 - Binary Semaphore
- Banker's algorithm is used?
 - To prevent deadlock
 - To deadlock recovery
 - To solve the deadlock
 - None of these
- What type of scheduling is round-robin scheduling?
 - Linear data scheduling
 - Non-linear data scheduling
 - Preemptive scheduling
 - Non-preemptive scheduling

iv) Consider the following three processes in the FCFS.

Process ID.	Burst-time.	Arrival-time
P1	3	3
P2	6	6
P3	9	9

What is the average waiting time?

- a. 2
- b. 3
- c. 4
- d. 5

v) Which of the following "semaphore" can take the non-negative integer values?

- a. Binary Semaphore
- b. Counting Semaphore
- c. Real Semaphore
- d. All of the these

Section – B (खण्ड-ब)

Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words.
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

5x7=35

- i. Define the term preemptive and non-preemptive. Explain critical section problem. Also give a solution to critical section problem which satisfy the requirements.
- ii. Define starvation in operating system. What is the need of swapping in OS? Explain any two classical problem of process synchronization.
- iii. Describe semaphore and operation of semaphore. What are the usage of semaphore. What are the two methods of deadlock prevention strategies?
- iv. What is synchronization in operating system? Explain types of scheduling. Describe necessary condition for deadlock.
- v. What is the concept of deadlock and race condition? Explain two Deadlock mechanism. Which algorithm is most widely used to avoid deadlock.
- vi. Describe the fundamental model of IPC. Explain monolithic kernel and micro kernel. Name any two non-preemptive scheduling.
- vii. Describe the role of memory management and page size in operating system? Explain memory management techniques.

Section - C (खण्ड-स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words.

2x10=20

निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

- i) Explain Paging in Operating System with help of proper explanation by giving example. Also differentiate between page fault and page replacement. Why paging algorithm is important?
 - ii) What is disk management in operating system? Explain disk management techniques used in operating system. Describe the concept of Boot blocks and bad blocks.
 - iii) Explain objectives of file management in operating system. Also describe the types of file management in operating system. How are file permission and access control managed?
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